It is hoped that in the near future an opportunity will be found to obtain, not only a close estimate of the cost of a tidal installation, but also a proof in practice of its convenience and economy as a means of reducing the national consumption of fuel. C. A. BATTISCOMBE.

NOTES.

THE ninety-sixth annual meeting of the Société Helvétique des Sciences Naturelles is to take place this year at Frauenfeld from September 7 to 10. The programme is an interesting one. Among the lectures announced which are likely to attract considerable attention we notice that by Dr. de Quervain, of Zürich, on the Swiss Expedition to Greenland and its results, and that by Prof. Keller, of Zürich, on the geography of the fauna of the Caucasus, both of which are to be illustrated by lantern slides. Prof. Maillefer, of Lausanne, who will speak of his researches on the laws of geotropism, and Prof. Dutoit, of the same city, who will discourse on recent conquests in the realm of analytical chemistry, are equally certain of an attentive audience. Besides these, Prof. Grubemann's, of Zürich, account of the development of the modern theory of rocks, and Prof. Rikli's geographical studies in the flora of the Caucasus, as well as Prof. Fuhrmann's, of Neuchatel, sketch of his scientific researches during his journey through the Cordilleras of Columbia, will be awaited with interest. Among the men of science who have announced their intention of making communications to the separate sections are Prof. Edouard Fischer, of Bern, and Prof. Ernst, of Zürich, in the botanical section; Dr. Paul Arbenz and Dr. H. Schardt, of Zürich, in the geological section; Prof. C. E. Guye, of Geneva, and Prof. Perrier, of Lausanne, in the physical section, as well as Prof. Einstein and his colleague at Zürich, Prof. M. Grossmann, in a discussion of the physical and mathematical basis of the theory of gravitation, to take place at a common sitting of the physical with the mathematical section. In the latter section, though only added of late years, there is a relatively large number of communications inscribed, of which several are concerned with the more recent theories. In the section for geophysics Prof. P. Mercanton, of Lausanne, and in the section for chemistry, Prof. A. Pictet and Dr. G. Baume, of Geneva, are reading papers.

THE third International Congress for Diseases of Occupation will take place under the presidency of Dr. F. von Haberler and Prof. A. Schattenfroh in Vienna in September, 1914. The subjects for discussion will be :—"The Physiology and Pathology of Fatigue, especially with Regard to Professional Work, Overwork, and Nightwork," "work in Hot and Damp Air," "Anthrax," "Pneumoconiosis," "Electrical Industrial Injuries," "Industrial Poisoning, especially by Anilin, Mercury, and Lead," "Industrial Injuries to Hearing," and "Independent Communications." The general secretary is Dr. Ludwig Teleky, Vienna IX., 23, Türkenstrasse.

THE fourth International Congress of School Hygiene was opened at Buffalo on Tuesday last, and will continue in session until Saturday next. The president is Dr. C. W. Eliot. The work of the congress is divided amongst three sections, devoted respectively to "The Hygiene of School Buildings, Grounds, Material Equipment, and Upkeep," "The Hygiene of School Administration, Curriculum, and Schedule," and "Medical, Hygienic, and Sanitary Supervision in Schools."

THE eleventh International Conference on Tuberculosis will be held in Berlin from October 22 to 25. Among the communications promised are the following :—"Clinical Forms of Koch's Bacillosis at Different Periods of Life," by Prof. Landouzy; "The Surgical Treatment of Pulmonary Tuberculosis," by Dr. Brauer; "Life Insurance," by Dr. K. Frankel; "State Insurance and Schools for Children with a Tendency to Tuberculosis," by Prof. Pannwitz.

THE annual meeting of the International Association of Medical Psychology and Psychotherapy will take place at Vienna on September 19 and 20. The general secretary is Dr. L. Frank, 45, Zürichbergstrasse, Zürich.

THE death is announced, from Bonn, of Robert Rieder Pasha, the well-known surgeon, at the age of fifty-one years. In 1898 he became a professor in the University of Bonn. Afterwards he became Inspector-General of Medical Schools in Turkey, and received the title of Pasha. He remodelled the system of medical training in Turkey, and was responsible for the establishment of several hospitals and similar institutions in and near Constantinople, and returned to Germany in 1906.

THE death is announced, in his fifty-sixth year, of Mr. C. Leslie Reynolds, superintendent of the National Botanic Gardens at Washington. He had been connected with the gardens for nearly forty years.

THE death is announced, in his seventy-third year, of Mr. W. Whitehead, president of the British Medical Association in 1902, and from 1894 to 1900 professor of clinical surgery in the Victoria University of Manchester.

THE death is announced of Mr. J. R. Sheldon, a well-known agriculturist, at the age of seventy-three years. Mr. Sheldon was appointed to the chair of agriculture at the Royal Agricultural College, Cirencester, in 1877, being subsequently lecturer on dairy farming at Downton Agricultural College. He was the author of "Dairy Farming" and "Live Stock in Health and Disease."

THE late Sir Jonathan Hutchinson, F.R.S., left by will the following directions regarding his museums at Selby, Haslemere, and Chenies Street, London :—"I leave the three museums at Haslemere, Selby, and 22 Chenies Street, and their contents to my trustees upon trust to dispose of the same as they in their own absolute discretion shall think best, but my desire is that, without imposing any trust upon my said trustees, they shall dispose of my said museums and their contents in accordance with my wishes expressed to them during my life."

By the will of Prof. Emil Chr. Hansen and his wife a fund bearing his name has been established. At intervals of two or three years, beginning in 1914, a gold medal bearing his effigy and accompanied by a sum of at least 2000 kroner is to be awarded on May 8 to the author of a meritorious publication on some microbiological subject, and recently published in Denmark or elsewhere. In 1914 the medal will be awarded to a worker in the field of medical microbiology. The president of the board of trustees is Prof. S. P. L. Sorensen, the Chemical Department of Carlsberg Laboratory, Copenhagen, from whom all information may be obtained.

On the closing day of the International Congress of Medicine, an address on the relationship between medicine and public health was delivered by the President of the Local Government Board, the Right Hon. John Burns, M.P. He surveyed the saving of life which has been effected by the application of sanitary measures, the decline in such diseases as enteric and typhus fevers, which are due to local insanitary conditions, and the stages in the registration of disease, which has proved so powerful an agent in its control. Finally, a tribute was paid to the nursing profession, and the interesting fact noted that Florence Nightingale, who initiated our present nursing system, received her preliminary training in a German institution, the Deaconess's Institute at Kaiserwörth, on the Rhine.

We see by *The Townsville Daily Bulletin* (Queensland) that the Australian Institute of Tropical Medicine at Townsville was officially opened on June 28 by Sir William MacGregor, the Governor of Queensland, in the presence of many men of science and medical men. In the course of an inspiring address, Sir W. MacGregor traced the evolution of the movement for the foundation of the institute, giving especial credit for work done to the Rt. Rev. Dr. Frodsham, formerly Bishop of North Queensland, and to Prof. Anderson Stuart, dean of the faculty of medicine in the University of Sydney. He then spoke of the work to be done by the institute in the following words:—"The field that lies open to this institute for investigation is vast and varied, covering as it does not only different races of men in health and disease in the tropics of Australia, in Papua, and in the Pacific Islands, but also all other creatures in the same great area, for in these times the transmission of many diseases from other beings to man is well known, typical of which is the 'Rossa Cycle' in malaria; but there are many others, such as the Guinea worm, from a small cyclops; yellow fever, filaria, and dengue, from mosquitoes; tapeworm from domestic animals, &c. Research work in this institute will, however, not be limited to animal organisms, but will also embrace the vegetable kingdom, especially in the forms of foods and poisons; and now, in view of the researches of Dr. Erwin Smith on cancer in plants, caused by the *Bacterium tumefaciens,* and of the remarkable conclusions of Johnson, that the bud rot of the cocoanut palm is caused by *B. coli,* the pathology of the vegetable kingdom will demand much greater attention than has hitherto been given to that subject. The institute will also concern itself with such elementary things as earth, air, water, and sunshine; in short, with everything that influences the physical life of man in the tropics. Researches in this institute will also embrace questions that concern industrial life in our tropics. Dr. Breinl's work on nodules has already been of such a character as to demonstrate that the institute will be of much service to our flocks and herds, and be important in our economic pursuits." He then touched upon the investigations that will be carried out with reference to the effect of climate on the white race in tropical Australia; the proper kind of houses to be erected for their use; the most suitable forms of food and clothing for them; the study of insect and bacterial life in disease; the economic work which will be undertaken, and the value of such an institution to the medical man who has to deal with diseases peculiar to the tropics.

A second report (the first was issued in 1910) on infant and child mortality, by the medical officer of the Local Government Board, Dr. Newsholme, has been issued by the Board. The task of the present report has consisted mainly in setting out the facts as to incidence of mortality, and in attempting to render conspicuous the experience of those towns or parts of towns in which an excessive sacrifice of child-life occurs. A great saving of child-life has been effected in the last few years, and a large portion of this decline has occurred in the towns now under report. It is satisfactory to find that this saving of life cannot be attributed merely to favourable climatic conditions, but to some degree at least is the result of improved sanitary and housing conditions. In the first part of this report the detailed facts as to incidence of infant and child mortality are set out. In its second part the close interrelationship between defective sanitation, poverty and intemperance, and excessive mortality is discussed. In its third part, a preliminary statement as to child welfare work is given.

It is announced in *The Times* that Mr. Peter Waite, of Adelaide, South Australia, is sending a collection of animals to the Scottish Zoological Park. The collection includes two kangaroos, four Bennett's wallabies, four rock wallabies, two emus, two opossums, two eagles, two Tasmanian devils, two black swans, two magpie geese, and two ibises. The Adelaide Zoological Garden is sending two dingos, and Mr. S. S. Ralli, of Adelaide, two giant kingfishers. Mr. E. J. Robertson Grant, of Edinburgh, who is at present in the Argentine, has also intimated that he is getting together a collection of animals for the Zoological Park, and will bring them with him when he returns to Scotland in November next..

Hungary possesses a Governmental institution for the scientific study of ornithology, the Magyar Királyi Központ, or Königlich Ungarische Centrale, to which has recently been added an anatomical department, the staff of which publishes its researches in the periodical *Aquila.* Dr. Greschik, one of the assistants, has made a renewed study of the microscopic structure of the rectum of some sixty kinds of native birds.

The histology of this class is usually treated somewhat cursorily in our text-books, mainly because of the minute size of the avine cells in comparison with those of other vertebrates. A number of good text-figures and a plate illustrate the details, most of which naturally can interest the specialist only, but there are also observations and conclusions, for instance, those concerning leucocytes and the protoplasmic rods of the cylindrical epithelial cells, which are of general physiological importance.

To *The Field* of August 23 Mr. R. I. Pocock contributes an article on the skin-glands of shrew-mice, in which it is pointed out that the gland on the flanks of the British species, which is generally supposed to emit the musky odour characteristic of these animals, is present only in the males. On the other hand, it is developed in both sexes of the Indian musk-shrew (Crocidura), as well apparently as in the Continental representative of that genus. It has been generally stated that the musky odour of all shrews is protective, but, in the members of the typical genus, if it be emitted by the gland, it must be a sexual feature, probably designed to attract the females. Before this can be definitely decided, it has to be ascertained whether the females of British shrew-mice are musky. If they are not, the numerous shrew-mice left dead by cats in gardens in autumn must probably all be males. Quite apart from the question whether the glands be its source, it seems, on the other hand, quite evident that in the Indian musk-shrew and its near relatives the musky odour is highly protective, rendering these animals obtrusive and "self-advertising."

THE current number of *The Quarterly Journal of Microscopical Science* (vol. lix., part 2) contains a very interesting article by Mr. E. S. Goodrich on metameric segmentation and homology. He discusses the well-known difficulty that organs which are undoubtedly homologous, inasmuch as they can be traced back to corresponding parts in a common ancestor, may nevertheless occur on different segments in different representatives of a group. The paired limbs of vertebrates are cited as typical illustrations of the problem. These shift backwards or forwards during the course of evolution in the most perplexing manner. Mr. Goodrich holds that, in order that they may be regarded as strictly homologous, it is not necessary that organs should be developed on corresponding segments in different types, and he accounts for their variation in position by a process of "transposition," rejecting the theories of intercalation and excalation of segments, re-division of the body and migration of the organs in question.

THE August number of *The Museums' Journal* is chiefly devoted to reports of the recent conference of the Museums' Association at Hull, including the presidential address delivered by Mr. E. Howarth. It is illustrated with a portrait of the president, and a photograph of the members of the association at Burton Constable, the seat of Major Chichester-Constable.

IN the second volume on insects in *The Cambridge Natural History* it is stated that the family Fulgoridæ "includes the so-called lantern-flies, in which the front of the head forms a huge proboscis that was formerly believed to be luminous." In the August number of *The Zoologist* Mr. H. W. Bell-Marley records the emission of light by the adult of a Natal species (*Rhinorthra guttata*), as well as by parasitic lepidopterous larvæ with which it is infested.

The Scientific American announces an alteration in the system of issue of publications by the United States Department of Agriculture. The old independent series of bulletins and circulars of the thirteen publishing bureaus, divisions, and offices of the department have been discontinued and will be superseded by a new *Journal of Research* for printing scientific and technical matter, and by a departmental series of bulletins, written in popular language for selected and general distribution. By this plan the confusion that has resulted from the multiplicity of series of publications will be avoided, and the saving of a considerable sum will annually be effected. Under the new plan the department will discontinue the general distribution of matter so scientific or technical as to be of little or no use to the lay reader. It will supply technical information only to those directly interested and capable of using scientific analyses, and of understanding the results of research work couched in scientific terms. A larger amount of information in popular form which the average reader can immediately apply to his own direct advantage will hereafter be distributed.

WE have received from Dr. J. H. Maiden a reprint of the presidential address delivered by him last year to the Royal Society of New South Wales. This address ranges over a wide and varied field, and contains much that is of general interest, including obituary notices and memoirs of Sir Joseph Hooker, Lord Lister, and Baron von Mueller. Reference is made to the forthcoming Melbourne meeting of the British Association and to other scientific matters of Australian interest, such as the Northern Territory Expedition of 1911, the exploration of Antarctica, the centenary of the Sydney Botanic Gardens, &c. After dealing with some botanical matters, such as the teaching of botany, a plea for a botanical survey and a new census of New South Wales plants, Dr. Maiden proceeds to set forth in some detail his views regarding the functions of a botanic garden, with suggestions as to work in phyto-chemistry and other practical proposals for increasing the usefulness of botanic gardens in Australia or elsewhere.

DR. W. A. CANNON, of the Carnegie Institution Desert Laboratory, Tucson, Arizona, has forwarded a reprint of an interesting paper on some features of the root systems of desert plants (*Popular Science Monthly*, vol. lxxxi). Among desert shrubs there are three main types of root system: (1) the superficial type, in which the roots extend horizontally from the plant axis, and lie near the soil surface; (2) the tap root, which goes directly down to a depth determined partly by the character of the soil, partly by the penetration of the rains and partly by the character of the root itself; (3) the generalised type of root, which not only reaches widely, but also penetrates fairly deeply.

The third, or generalised type, is characteristic of the great majority of desert plants; the prevalent idea that the roots of such plants are usually very long has no adequate foundation. The author adds interesting notes on the environment of the roots of desert plants —height of water-table in the soil, soil temperature, soil air, &c.—and indicates the problems which are being investigated at the Desert Laboratory with regard to the relation between desert plants and the soil.

THE relative value of strong and weak wheats is a controversial question which has more than once engaged attention in the columns of NATURE. The former type of wheat yields flour which is preferred by the professional baker in large cities for a number of reasons, and therefore commands a higher price. It has come to be considered of higher quality, and it is at present the object of wheat breeders all the world over to convert the indigenous weak wheats into stronger varieties. It is generally stated (for example, Humphries, Royal Society of Arts, 1909, 239) that the wheats which yield flour better suited for British consumption (by which the manufacturing centres and towns are implied), do not suit the native Indian requirements so well; indeed, wheat is more often consumed by the natives in the form of coarse cakes toasted by the side of an open fire than in the form of the light, well-risen loaf known to us. However, Mr. and Mrs. Howard, whose work in improving Indian wheats is receiving wide recognition (see NATURE for August 7, p. 586), write to say that they do not agree with this view of the question, and they claim that the class of wheat preferred by the people of India for their own food is the same as that in greatest demand in the English markets. Mr. and Mrs. Howard realise fully (*Agric. Journal of India,* iii., p. 31) that any improvement in the quality of wheat to be of importance must satisfy both the people of India and the home millers.

THE cultivation of tobacco in the Nyasaland Protectorate would appear to be full of promise, if one may judge from the report of the director of agriculture for the past year. During the period 1902–12 the total export of tobacco has increased from 60 lb. to 2¼ million lb., and the locally grown material so strongly resembles Virginian-grown tobacco that it is readily absorbed by the trade. In view of the large grants which have been made from the Treasury towards the cultivation of small quantities of inferior tobacco in Ireland, it is certainly striking that so much progress has been made in Nyasaland, even without the assistance of a tobacco expert. The claim is made that the possibilities of the Protectorate for tobacco-growing are probably greater than those of any other part of the British Empire.

A USEFUL note on "Thunderstorm Statistics of Egypt" is contributed by Mr. E. W. Bliss to *The Cairo Scientific Journal* for June. The data are summarised from a list of all available records of storms prepared by request of the Cairo Department of Ordnance by the Meteorological Service, and refer chiefly to observations at Abbasia between 1868 and 1912. A table including both slight and severe storms, and also many cases where only lightning was observed, shows that during the above period electrical discharges were experienced on 180 days only. Cases occurred in each month except July, the majority being in October and November, and their rarity bears out a statement previously made that in Egypt thunderstorms are comparatively few in number. Storms accompanied by hail or heavy rain, or which did damage to buildings, only amounted to twenty-eight in the forty-five years, an average of rather more than one in two years. The discharges appear to occur most frequently during the evening hours.

THE Canadian Department of the Naval Service, Ottawa, has issued a useful pamphlet on "The currents in the entrance to the St. Lawrence," from investigations of the tidal and current survey in the seasons of 1895, 1911, and 1912. The most modern methods were employed in the investigation; the temperature and density of the water, and complete meteorological observations were also taken. Between the Gaspé coast and Anticosti the currents present a complete contrast in their behaviour; on the one shore there is a current flowing always in the same direction, while on the other the set is weak and continually veering. One of the chief endeavours has been to reduce these currents to law, and in the case of the Gaspé current it has been largely successful. Although the veering currents are weak, and at times irregular, it has been possible to prove that the tide has a dominating influence upon them, and that their directions during flood and ebb are fairly definite as a rule. The features of both currents are discussed in considerable detail.

THE July number of *Himmel und Erde* contains the address delivered by Dr. M. Laue on taking up his professorship at Zürich in December last. Naturally, it deals with the new field of research opened up by his own experiments on the reflection of Röntgen rays by crystals. From the results obtained by himself, and by others who have repeated his experiments, he concludes that the wave theory of the constitution of Röntgen rays is in much closer accord with the facts than the form of emission theory advocated by Prof. Bragg. The difficulties in the way of its general acceptance are not greater than those with which the wave theory of light has to deal, and the rejection of the wave theory in one case would necessitate its equal rejection in the other.

IN a paper read before the American Institute of Electrical Engineers in March last, Mr. C. Fortescue showed how the excessive concentration of electrical stress which is to be found at certain parts of the insulation of electrical apparatus could be replaced by a uniform stress of much smaller amount. A short account of the electrostatic theories which underlie Mr. Fortescue's method is given by Prof. W. S. Franklin, of Lehigh University, in the July number of the Journal of the Franklin Institute. Prof. Franklin shows that the two propositions—an equipotential surface may be to any extent replaced by a thin metal sheet without disturbing the field, and a closed metal shell screens its inside from outside effects—form the basis for most of the devices suggested. Taking the field round a charged wire or that between two charged wires as his starting point, he builds up by simple processes the most important practical cases. His paper concludes with a warning against the frequent use of the idea of potential in cases in which the simpler one of the electric field will give all the required information.

OUR ASTRONOMICAL COLUMN.

The Origin of Solar Electricity.—Among the many interesting papers concerning astrophysical matters which appear in No. 8 of the *Monthly Notices* of the Royal Astronomical Society, attention may be directed to a convincing contribution to our knowledge of the agencies originating the vast solar electrical phenomena demonstrated by the brilliant researches effected at Mount Wilson. In a paper under the above title Dr. J. A. Harker applies the results of laboratory work conducted in collaboration with Dr. G. W. C. Kaye at the National Physical Laboratory to the explanation of cosmical phenomena. This experimental work has shown that at very high temperatures the vapours in the tube resistance furnace become highly conducting, and that under the same condition most refractory substances emit electricity carried by particles many times the mass of an atom of the substance. Calculations show that the measured emissivity of carbon at about 3000° C. would be ample to account for solar currents of magnitude sufficient to give rise to the intense magnetic fields Professor Hale has shown to be probably found in sun-spots.

The True Form of the Earth and its Internal Constitution.—Dr. A. Veronnet contributes a discussion of these subjects to No. 13 of the *Revue Générale des Sciences*. It is now known that this "somewhat irregular round body" on which we live has a rough sort of tetrahedral shape, but mathematicians must have a more generalised form, and thus for them the geoid is an ellipsoid of rotation of which the inverse of the eccentricity is about 297. Dr. Veronnet criticises the various formulæ which have been suggested to represent the hypothetical generating curve, and has himself proposed a new one. By considering the effect of variations of density and velocity of rotation limits are determined for the above-mentioned ratio, and it is shown that if the above value, found by Helmert, is supported, then the earth rotates as one piece. The author is also led to make some interesting conclusions regarding the effect of tides and causes of earthquakes.

Cosmological Hypotheses.—At the Science Congress held at Lourenço Marques, Mr. R. T. A. Innes, of the Transvaal Observatory, dealt with this subject, and added one hypothesis more which he referred to as "the explosion hypothesis." He assumes that matter will not indefinitely submit to continued reduction of volume under indefinitely increasing gravitational pressure, but that a time will come when this pressure will "break into the atomic structure of its matter and cause explosions." By such explosions the sun threw off the planets and the latter their satellites; in other stars they caused the formation of multiple systems; new stars are due to the eruptive outbursts accompanying the explosions, and when on a smaller scale and rhythmical they are responsible for the phenomena of variable stars. Mr. Innes, we may remark, has shown an inexplicable eclecticism in choosing his foundation facts; for example, he has ignored the harmonious results obtained by modern workers on the temperatures of the individual stars, but has selected a contrary opinion to the effect that solar type stars are hotter than the white stars.

MAGNETIC SURVEYS.[1]

The introduction tells us that this is the first of a series of volumes to be published dealing with the researches of the department of terrestrial magnetism of the Carnegie Institution of Washington, founded in April, 1904. These volumes, while principally on terrestrial magnetism, will contain memoirs on allied subjects, such as atmospheric electricity. The present volume treats of all the magnetic observations made *on land* by the department from the beginning of its observational work in 1905 up to the end of 1910. These observations are directed towards the accomplishment of one of the principal objects which the department has in view, viz. the acquisition of the data necessary for a general magnetic survey of the earth.

The first fifty pages deal with the general methods of work, the selection and description of stations, and especially with the field instruments and the taking and reducing of observations. The observational instruments—magnetometers, dip circles, and dip inductors—and auxiliary apparatus are handsomely illustrated in plates 2 to 6. Much experience of field-work has accumulated of late years at Washington, and the instructions to observers merit the careful attention of all interested in survey work. Pp. 51–6 introduce us to the results of the observations, which are chronicled in the later part of the volume. On p. 53 is a list of thirty-five observers whose work is included. Amongst them are several eminent foreigners, including Prof. Palazzo, of Rome, and Profs. Beattie and Morrison, of South Africa, who have observed for a time under the auspices of the Carnegie Institution. The stations observed at number almost 1300, of which more than 1200 are outside the bounds of the United States.

Of the continents, Africa shows the largest number of stations, 386, the great majority of which were occupied in 1907 and 1908 by Profs. Beattie and Morrison. Of the 328 stations in North America, 189 were in Canada or Newfoundland, fifty-nine in Central America, and nine in Greenland. In Asia there were 308 stations. Of these 142 were in China—occupied mainly by Messrs. Edmunds and Sowers—thirty-seven in Persia, thirty-two in Russian and eighty-one in Turkish territory. The observations in Asiatic Turkey were due mainly to Mr. Sligh, but partly to Mr. J. C. Pearson. The latter gentleman seems to have taken all the observations in Persia and in Asiatic and European Russia, and most of those in Egypt. He also observed in Canada, in European Turkey, at Pola, Potsdam, and Kew Observatories, and was amongst the crew of the surveying ship *Galilee*, who observed in Japan, Australia, and New Zealand. His experiences as a traveller should be of interest. Of the remaining stations, 111 were in South America, and 119 in numerous islands in the Pacific and Atlantic Oceans.

The tables of results, pp. 58–100, give for each station the geographical coordinates, the date and hours of observation, the observed values of magnetic declination, inclination, and horizontal force, the instruments used, and the observer's initials. Pp. 101–120 contain interesting extracts from the reports made by the several observers. The rest of the volume is occupied by minute descriptions of the stations, to facilitate their identification. An artistically attractive feature is the reproduction in plates 1 and 7–10 of a number of fine photographs, showing a selection of the stations occupied or scenes in their neighbourhood.

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[1] "Researches of the Department of Terrestrial Magnetism. Land Magnetic Observations 1905–10." By L. A. Bauer, Director of the Department. Pp. 185+10 plates. (Washington, D.C.: Published by the Carnegie Institution of Washington, 1912.)